AF/GP 1743 JFW

MS APPEAL BRIEF - PATENTS
PATENT
2964-0102P

IN THE U.S. PATENT AND TRADEMARK OFFICE

In re application of		Before the Board of Appeals	
Rolf SKOLD		Appeal No.:	
Appl. No.:	09/381,828	Group:	1743
Filed:	November 24, 1999	Examiner:	A. SODERQUIST
Conf.:	4478		
For:	THE CHARACTERISATION OF PHYSICAL AND CHEMICAL PROPERTIES OF A LIQUID AND A DEVICE THEREFOR		

APPEAL BRIEF TRANSMITTAL FORM

MS APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

July 6, 2004
(Tuesday after Federal Holiday)

Sir:

Transmitted herewith is an Appeal Brief (in triplicate) on behalf of the Appellants in connection with the above-identified application.

☐ The enclosed document is being transmitted via the Certificate of Mailing provisions of 37 C.F.R. § 1.8.

A Notice of Appeal was filed on May 3, 2004.

☒ Applicant claims small entity status in accordance with 37 C.F.R. § 1.27

The fee has been calculated as shown below:

☐ Extension of time fee pursuant to 37 C.F.R. §§ 1.17 and 1.136(a) - $0.00.

☒ Fee for filing an Appeal Brief - $165.00 (small entity).

☒ A check in the amount of $165.00 is attached.

☐ Please charge Deposit Account No. 02-2448 in the amount of $0.00. A triplicate copy of this sheet is attached.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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DRA/ETP/las
2964-0102P

Attachment(s)

(Rev. 02/08/2004)

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APPEAL BRIEF

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

July 6, 2004
(Tuesday after Federal Holiday)

Sir:

Pursuant to the Notice of Appeal filed on May 3, 2004, the following Appeal Brief is respectfully submitted in connection with the above-identified application in response to the final rejection of claims 1, 2, 4, 5, 6, 7, 8 and 10 dated December 3, 2003.

I. Real Party in Interest

The real party in interest is Rolf Skold, the sole inventor and owner of all right and title in the claimed invention. No assignment of the claimed invention has been executed nor is of record.

II. Related Appeals and Interferences

There are no related appeals or interferences pending for the present application.

III. Status of Claims

Claims 1-10 remain pending in the present application. Claims 1 and 7 are independent claims. Claims 3 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if properly rewritten into independent form. Claims 3 and 9 are not at issue in the present appeal. No claims have been previously canceled.

Claims 1, 2, 4, 5, 6, 7, 8 and 10 stand rejected under 35 U.S.C. § 103(a), in the final Office Action dated December 3, 2003, as being unpatentable over "Franchini" (G. Franchini *et al.*, *J. Chem. Soc., Faraday Trans. 1*, Vol. 85(7), 1697-1707 (1989)) in view of "Baxter" (D.C. Baxter *et al.*, *Chem. Abstr.*, Vol. 112, 209884s) and "Cunha" (I.B.S. Cunha, *Analyst*, Vol. 117, pp. 905-11 (1992)) or "Renoe" (B. W. Renoe *et al.* (*Analytical Chemistry*, Vol. 48, No. 4, pp. 661-66 (1976)) and "Bader" (M. Bader (*Journal of Chemical Education*, Vol.

57, No. 10, pp. 703-6 (1980)), "Laughlin" (R.G. Laughlin, *Journal of Colloid and Interface Science*, Vol. 55, pp. 239-241 (1976)), "Li" (H. Li, *Analyst*, Vol. 112, pp. 1607-9 (1987)), "Rodriguez" (L.C. Rodriguez *et al.*, *Journal of AOAC International*, Vol. 78, No. 2 (1995)) or "Saxberg" (Bo. E.H. Saxberg *et al.*, *Analytical Chemistry*, Vol. 51, No. 7, pp. 1031-38 (1979)). Several rejections exist since the Examiner has cited a multitude of references that could be combined in various ways. Any and all of the various final rejections concerning claims 1, 2, 4-8 and 10 are appealed.

IV. Status of Amendments

The Office Action finally rejecting claims 1, 2, 4-8 and 10 is dated December 3, 2003. All replies filed subsequent to the final rejection as filed by Appellant have been acknowledged by the USPTO, and all except one reply have been entered of record. The replies that have been acknowledged and entered are as follows:

- the Office Action of December 3, 2003, is in response to Appellant's reply of September 22, 2003 (entered);
- the Office Action of June 18, 2003, is in response to Appellant's reply of April 7, 2003 (entered);
- the Office Action of December 10, 2002, is in response to Appellant's Reply and Request for Continued Examination of October 3, 2002 (entered);

- the Office Action of June 7, 2002, is in response to Appellant's reply of April 18, 2002 (entered);
- the Office Action of January 18, 2002, is in response to Appellant's reply of November 5, 2001 (entered); and
- the Office Action of July 5, 2001, was the first Office Action issued in the present application.

However, Appellant's reply of September 9, 2002, was acknowledged (in the Advisory Action of September 16, 2002) but was not entered of record (Appellant filed the Request for Continued Examination with a Reply dated October 3, 2002, without requesting entry of the September 9, 2002 Reply).

In response to the final Office Action of December 3, 2003, Appellant filed a Reply Under 37 C.F.R. § 1.116 on March 3, 2004. Also, Appellant filed a Supplemental Reply Under 37 C.F.R. § 1.116 on March 30, 2004. The first Advisory Action dated March 31, 2004, with an attached Interview Summary, indicates that the reply of March 3, 2004, would be entered for purposes of Appeal (Box 7 on the PTOL-303 form). The second Advisory Action dated April 12, 2004 indicates that the reply of March 30, 2004 would be entered for purposes of Appeal (Box 7 on the PTOL-303 form). Thus, Appellant's replies of March 3, 2004, and March 30, 2004 have been acknowledged and entered of record for purposes of this appeal. Claims 1, 2, 4-8 and 10 as entered for

purposes of appeal are reflected in the Appendix (attached at the end of this Appeal Brief).

V. Summary of Invention

Generally, the present invention provides an automated method for the collection of data in electronic form for a three-dimensional diagram (*i.e.*, phase diagrams) containing a dependent physical and/or chemical property of a liquid as a function of temperature and a component concentration as independent variables (see the present specification at page 1, lines 4-8; see also page 3, lines 1-32 and Figure 2 showing the three-dimensional diagram). The method and device of the present invention enable the access of a large number measuring points of physical or chemical properties of a liquid as a function of temperature and concentration of a component (see the specification at page 3, lines 10-27, and the paragraph bridging pages 5-6).

Specifically, in one embodiment, the present invention is directed to a method for the characterisation of physical and/or chemical properties of a liquid (see the features of pending claim 1 and page 2, lines 6-25 of the specification), characterised by several steps:

1) at least one dependent physical and/or chemical property of a liquid is measured in a measuring cell as a

function of temperature and a component concentration as independent variables,

2) the values for the component concentration in the measuring cell are determined by calculation, based on data from a control program for the change of component concentration in a computer and the temperatures are determined by calculation from a temperature control program or by measurements;

3) the value of the component concentration in the measuring cell is changed by adding in one step or gradually a predetermined amount of another liquid containing a different component concentration into the measuring cell according to the control program for the change of the component concentration, and a representative number of measurements of the dependent physical or chemical property are performed in the measuring cell within the whole selected temperature range within the predetermined change of the component concentration,

4) the procedures above are repeated at desired component concentrations and temperatures in order to obtain a wanted number of values;

5) the values obtained for the dependent properties are combined with the values for the independent properties to measuring points; and

6) the measuring points electronically stored in the computer are co-ordinated and visualised in a three-dimensional diagram.

In addition, as recited in claim 7 (see also the specification at page 4, lines 1-20 and Figure 1 displaying a schematic for the device), the present invention is directed to a device embodiment for the characterisation of the physical and/or chemical properties of a liquid, which comprises components (a)-(c):

a) a measuring cell (1) provided with

i) an equipment (2) for the homogenisation of a liquid,

ii) at least two control equipment (3, 17), which comprise or are attached to control programs for changing of the two independent variables, component concentration and temperature, in a predetermined manner, the control equipment (3) of the component concentration comprising a dosage organ for the addition of another liquid containing a different component concentration to the measuring cell,

iii) at least one measuring organ (9, 13, 14) for the determination of at least one dependent physical and/or chemical property of the liquid, and

iv) optionally a measuring organ (15) for the determination of the temperature,

b) at least one computer (5) for

i) the reception and storage of data relating to the dependent and independent variables via at least one electronic circuit (11', 12', 13', 14', 15') and the calculation of at least the component concentration from data obtained from the control program and

ii) compilation of the received and calculated values into three-dimensional measuring points and

c) equipment (16) for visualisation of the measuring points stored in the computer in a three-dimensional diagram.

Thus, as claimed, measurements are performed in one measuring cell (1) which is combined with two sets of control equipment (3, 17), which comprise or attach to the control programs for the change of temperature and component concentration (see the specification at page 2, lines 26-31; also Figure 1 and page 5, lines 3-18). Measuring organs (9, 13, 14, and optionally 15) for the determination of at least one physical and/or chemical property is also included within the device of claim 7, and the data is routed and visualized via the computer (5) and equipment (16) (see the specification at page 2, lines 26-31; see also Figure 1).

Other embodiments of the present invention include variations of device claim 7 (see pending claims 8 and 10 and the specification at page 4, lines 21-29), a program in the computer controlling the

changes in concentration and/or temperature for method claim 1 (see pending claim 4), measurements conducted in view of the temperature parameter for method claim 1 (see pending claims 2 and 5), and measurements conducted in view of the concentration component parameter for method claim 1 (see pending claim 6).

VI. Issues Presented

Whether or not claims 1 and 4 are patentable under 35 U.S.C. § 103(a) over the combinations of Franchini, in view of Baxter and Cunha or Renoe and Bader, Laughlin, Li, Rodriguez or Saxberg.

Whether or not claims 2 and 5 are patentable under 35 U.S.C. § 103(a) over the combinations of Franchini, in view of Baxter and Cunha or Renoe and Bader, Laughlin, Li, Rodriguez or Saxberg.

Whether or not claim 6 is patentable under 35 U.S.C. § 103(a) over the combinations of Franchini, in view of Baxter and Cunha or Renoe and Bader, Laughlin, Li, Rodriguez or Saxberg.

Whether or not claims 7, 8 and 10 are unpatentable under 35 U.S.C. § 103(a) over the combinations of Franchini, in view of Baxter and Cunha or Renoe and Bader, Laughlin, Li, Rodriguez or Saxberg.

VII. Grouping of Claims

Appellant respectfully requests that the claims be grouped as follows.

Group I - Claims 1 and 4

Group II - Claim 2 and 5

Group III - Claim 6

Group IV - Claim 7, 8 and 10

For purposes of the instant Appeal, each Group of claims is separately patentable, such that the claims encompassed thereby do not stand or fall together. This is because each Group recites a further feature, which the asserted combinations under 35 U.S.C. § 103(a) do not disclose, teach or suggest. Each of Groups I-IV is discussed in further detail in Appellant's Arguments below as to why each Group of claims is considered separately patentable.

VIII. Arguments

Appellant contends that each Group of claims, which includes claims 1, 2, 4-8 and 10, is patentable under 35 U.S.C. § 103(a) over the combinations of Franchini, in view of Baxter and Cunha or Renoe and Bader, Laughlin, Li, Rodriguez or Saxberg.

Overall, Appellant asserts that the instant rejections should be reversed based on any one and all of the following:

- The cited combinations of references fail to disclose all claimed features;

- One having ordinary skill in the art would not be motivated in combining the cited references in order to achieve the present invention;
- One having ordinary skill in the art would not be reasonably expect to be successful in combining the cited references in order to achieve the present invention; and
- Unexpected results exist for the present invention, whereby such unexpected results rebut any asserted *prima facie* case of obviousness.

More specifically, claims 1-2, 4-8 and 10 are patentable over the cited combinations of Franchini, in view of Baxter and Cunha or Renoe and Bader, Laughlin, Li, Rodriguez or Saxberg, because the cited references, even when combined, fail to disclose all features as instantly claimed. Further, the cited references have been improperly combined since a person having ordinary skill in the art at the time of filing the present application, and upon reading the cited references, would not be motivated or reasonably expect to be successful in combining the cited references in order to achieve the present invention due to inconsistencies between the references. Further, the present invention has achieved unexpected results of a more efficient and improved method and device, which rebuts any asserted *prima facie* case of obviousness.

Arguments for Group I: Claims 1 and 4

In general, none of the cited combinations of references describes the present invention of a method for characterization of physical and/or chemical properties of a liquid wherein one dependent physical and/or chemical property of a liquid is measured as a function of both temperature and component concentration, and are controlled within selected ranges in order to obtain a wanted number of values (as asserted by Appellant previously; see, e.g., the reply filed March 3, 2004, starting at page 3, which includes a graph comparing the present invention with the cited references).

With respect to all rejections under 35 U.S.C. § 103(a), U.S. case law squarely holds that a proper obviousness inquiry requires consideration of three factors: (1) the prior art reference (or references when combined) must teach or suggest all the claim limitations; (2) whether or not the prior art would have taught, motivated, or suggested to those of ordinary skill in the art that they should make the claimed invention (or practice the invention in case of a claimed method or process); and (3) whether the prior art establishes that in making the claimed invention (or practicing the invention in case of a claimed method or process), there would have been a reasonable expectation of success. *See In re Vaeck*, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991); *see also In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1316-17 (Fed. Cir. 2000); *In re Fine*, 837

F.2d 1071, 1074, 5 USPQ2d 1596, 1599 (Fed. Cir. 1988). With regard to Appellant's position of patentability, Appellant respectfully submits that not all requirements for a *prima facie* case of obviousness have been satisfied based on the cited combinations of references, and thus the cited references have been improperly combined.

1. Summary of Lack of Disclosure of All Claimed Features

Below is a chart summarizing how each and every one of the cited references is deficient in disclosing all claimed features (this chart was submitted with Appellant's responses of March 3 (at page 4) and March 30 (at page 3), 2004). In this regard, Appellant respectfully asserts that a *prima facie* case of obviousness has not been established since the asserted combinations of references fail to suggest, teach or disclose all features as instantly claimed. *In re Vaeck*.

Characteristics of the Invention As CLAIMED		**COMPARATIVE CHART**						
No.	Feature	**CLAIM 1 of Appl. No. 09/381,828**	Franchini	Laughlin	Bader	Cunha	Baxter, Rodriguez, Li, or Saxberg	Renoe
1	Automated	**Yes**	No	No	No	Yes	No	Yes
2	Numerical measurement of property as a function of concentration and temperature	**Yes**	Yes	No*	No	No	No	No
3	Concentration is changed according to computerized control program and	**Yes**	No	No	No	No	No	Yes
4	calculated from the program by a computer	**Yes**	No	No	No	No	No	Yes
5	Temperature is changed by a temperature control program and	**Yes**	No	No	No	No	No	No
6	temperature is calculated from the program or by measurements	**Yes**	No	No	No	No	No	No
7	Concentration is changed by addition directly into the measuring cell according to the control program for concentration	**Yes**	No	No**	No**, ***	No	No	No
8	Measurements of the dependent property within the temperature range for each concentration level	**Yes**	Yes	No	No	No	No	No
9	Values of the property are combined with the independent variables by the computer	**Yes**	No	No	No	No	No	No
10	and the measuring points in the computer are coordinated and visualized in a 3-dimensional diagram	**Yes**	No	No	No	No	No	No
11	Determination of concentration from the control program	**Yes**	No	No	No	No	No	Yes

* no numerical measurements
** no change by control program
*** only additions to the sample for each determination of concentration

Appellant adds that a review of appealed claim 1 recites, at a minimum, all of the above features 1-11. Feature 1 in the graph regarding automation corresponds to all steps of claim 1; feature 2 of the graph corresponds to step 1 of claim 1; features 3 and 7 correspond to step 3 of claim 1; features 4-6 of the graph correspond to step 2 of claim 1; feature 8 of the graph corresponds to steps 1 and 4 of claim 1; features 9 and 11 correspond to step 5 of claim 1; and feature 10 corresponds to step 6 of claim 1.

2. A *Prima Facie* Case of Obviousness Has Not Been Established

Appellant respectfully submits that each and every reference has been improperly combined with one another and all requirements for a *prima facie* case of obviousness have not been satisfied (*i.e.*, lack of disclosure of all claimed features, lack of requisite motivation and lack of requisite reasonable expectation of success). The requirements for a *prima facie* case of obviousness are addressed below.

a. Lack of Disclosure of All Features As Instantly Claimed

As can be seen from the above chart, not even the cited combinations of references disclose all features as instantly claimed. For example, no cited reference even when combined with other cited references discloses the claim language labeled as 5 (temperature is changed by a temperature control program), 6, 7, 9 or 10. Thus, not

even the initial requirement for a *prima facie* case of obviousness has been met (*i.e.*, disclosure of all claimed features). *See In re Vaeck*. Appellant adds that such lack of deficient disclosure is not obvious to one of ordinary skill in the art (for the reasons stated below) since the Examiner has not provided sufficient evidence to prove otherwise that rebuts Appellant's presumption of patentability. Thus, reversal of all rejections is respectfully requested for the reason that the cited combinations of reference fail to satisfy the requirement of disclosure of all claimed features of the present invention.

With regard to the Advisory Action of March 31, 2004, which was in response to Appellant's reply of March 3, 2004, Appellant respectfully disagrees with the Examiner's position regarding the above graph (see "Continuation of 5." on the Continuation Sheet) (this is Appellant's first opportunity to address Examiner's comments). Appellant agrees that the chart would be applicable against any rejection under a subsection of 35 U.S.C. § 102. However, Appellant respectfully requests the Board to consider the above graph with respect to the outstanding § 103(a) rejections to show that not only that each cited reference is greatly deficient in its disclosure of the present invention, but that the cited references cannot be properly combined due to the many inconsistent disclosures in the reference. Further, with regard to the same Advisory Action, though

feature 5 is stated in the alternative as asserted by the Examiner, feature 4 or 5 is a required feature of the present invention. In either case, the cited combinations of references fail to render the present invention as obvious. In addition, feature 11 is not duplicative of any other feature as explained above.

With regard to the rest of the Examiner's comments in the March 31st Advisory Action (*i.e.*, the Examiner takes issue with Franchini in relation to features 5-6 and 9-10), Appellant respectfully submits that such points are addressed below.

b. Lack of the Requisite Motivation and Reasonable Expectation of Success

Appellant herein discusses the actual disclosure of the cited references with regard to the present invention, including how each of the references solves its problems. Overall, based on such disclosure in the cited references, Appellant submits that the references have been improperly combined and that the requisite motivation and/or reasonable expectation of success are lacking. Further, as can partially be seen from the above chart, Appellant submits that any cited combination of these references is improper.

(i) Franchini

Franchini is the primary reference. However, Franchini fails to disclose steps 2, 3, 4, 5 and 6 of instantly pending claims 1 and 4, and features 3-11 as seen in the graph above. Overall, Franchini has a deficient disclosure and one of ordinary skill in the art would not combine this reference with any of the other cited references in order to establish a *prima facie* case of obviousness.

In the final Office Action of December 3, 2003, Franchini is the only reference that is concerned with measuring a physical or chemical property as a function of both temperature and concentration. Specifically, on page 1697, last paragraph (and as stated in the December 3rd Office Action at paragraph 2, page 2), Franchini et al. makes the following statement:

> The large amount of experimental data obtained led us to make another attempt at an empirical approach to the problem of the dependence of the dissociation constant both on the temperature and on the composition of the binary solvent system.

From this statement, in contrast to the Examiner's comments in the final Office Action in the paragraph bridging pages 6-7, it is evident that the cited Franchini reference fails to disclose or recognize any solution to the problem of handling the large amount of data in connection with the creation of a three-dimensional diagram (*i.e.*, as stated in Franchini, " … led us to make another attempt at an empirical approach … "). Instead, Franchini makes an empirical

approach to clarify the dependence of the dissociation constant of weak electrolytes on the temperature and on binary ethane-1,2-diol and 2-metoxyethanol solvent systems. In the disclosure of this primary reference, conductance data from an earlier work were integrated by those obtained from three new mixtures. These new mixtures were prepared with purely manual methods (see p. 1698, 3rd paragraph). First, the solvents mixtures were prepared by weight. The solutions of picric acid at different concentrations were obtained by successive dilution of stock solutions. Then, the concentrations in volume were calculated from the weight concentrations and the densities. The conductance readings were recorded when they became invariant with time, which took about 30 minutes.

Still, the process disclosed in the cited Franchini reference is completely by hand or manual. Further, the steps 2, 3 (concentration is changed according to a computerized control program), 4, 5 and 6 of claim 1 of the present are not disclosed or recognized by the cited primary reference of Franchini. Franchini is far removed from the claimed invention.

It should also be observed that in the present invention the changes of the component concentrations are made by adding another liquid with a different concentration of the component **to the previous liquid or a part of the previous liquid in the measuring cell**. But in Franchini, the different samples were individually prepared from stock

solutions. This is in contrast to the present invention when in the present process there is only one sample existing at each point of time, namely the sample in the measuring cell, and, after the measuring of the dependent variable or variables, the succeeding sample **is directly prepared in the measuring cell**. These are significant and great differences in principles and goals between Franchini and the present invention with regard to preparing samples.

Appellant also submits that any cited reference used for a rejection under 35 U.S.C. § 103(a) must be considered in is entirety, *i.e.*, as a whole, including those portions that would lead away from a claimed invention. *See W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). In other words, the cited Franchini reference must be read in its entirety, including any *fundamental* difference when it comes to the preparation of samples.

As can be seen, the present invention is not only a simple "translation" of a manual method into an automatic process (see the paragraph bridging pages 6-7 of the December 3rd final Office Action for the Examiner's reasons for combining the cited references). One of ordinary skill in the art would recognize a multitude of factors for such a proposition. The final Office Action has not accounted for such problems and factors involved in automating such methods (*i.e.*, the manual method and lack of disclosure of handling large amounts of

data in Franchini). Instead, the conclusions in the final Office Action are devoid of such considerations (*i.e.*, how a succeeding sample is directly prepared in a measuring cell), and there is no clear and particular guidance in Franchini for the skilled artisan to make the claimed invention. Thus, Appellant respectfully submits that one of ordinary skill in the art would not even refer to the Franchini reference in the first place based on such principle differences. Accordingly, Appellant request reversal of all rejections based on the Franchini reference (*i.e.*, Franchini in view of Baxter and Renoe and Laughlin).

(ii) Renoe

Renoe fails to disclose features 2, 5 (temperature is changed by a temperature control program), 6, 7, 8, 9 and 10 (see the chart above) and one of ordinary skill in the art would not refer to the Renoe reference in the first place or upon a reading of the cited primary reference.

The cited secondary reference of Renoe relates to an automated system for preparing solutions. Specifically, Figure 1 on page 662 of Renoe shows a system that produces a large number of individual samples, which have to be handled later. This is contrast to the present invention that utilizes one sample, wherein new samples are directly produced in the measuring cell by the assistance of a control

program for the change of concentration. Thus, the Renoe disclosure relates to a method for handling sampling that is completely different than the method as instantly claimed (see the features of appealed claim 1 and 4). Thus, Renoe is inconsistent with the present invention and such inconsistencies have not been accounted for in the outstanding Office Action.

As asserted by Appellant in the reply of March 30, 2004 (starting at page 9), there is no "clear and particular" guidance in Franchini for one of ordinary skill in the art to refer to Renoe. The applicable case law here is *In re Dembiczak*, which holds that while a reference need not expressly teach that the disclosure contained therein should be combined with another, *see Motorola, Inc. v. Interdigital Tech. Corp.*, 43 USPQ2d 1481, 1489 (Fed. Cir. 1997), the showing of combining references "must be clear and particular". 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). Though the final Office Action refers to how it would be obvious to one of ordinary skill in the art to automate the Franchini method through use of an automated liquid handling system as disclosed in Renoe (see the final Office Action at page 6, lines 1-4 from the bottom), Appellant respectfully disagrees with this assertion. First, such a conclusion does not take into account the inconsistencies between the cited references. Second, a consideration of such inconsistencies reveals that the requisite motivation and reasonable expectation of success are lacking here.

As mentioned, the Renoe disclosure relates to a method for handling sampling that is completely different than method as instantly claimed. Accordingly, Appellant respectfully submits, based on the disclosure of Renoe and Franchini, one of ordinary skill in the art would not be motivated or reasonably expect to be successful in combining these references with any of the other cited references since both have features that are inconsistent with the claimed features. Some other method by combining these references would be generated with such a proposition, and there is no "clear and particular" guidance for one of ordinary skill in the art to even refer to Franchini in order to achieve the present invention.

Renoe further fails to disclose many features of the present invention (such as features 2 (numerical measurement of property as a function of concentration and temperature), 5, 6, 7, 8, 9 and 10 listed in the chart above). Given the deficiencies of the Franchini reference already, one of ordinary skill in the art would not be motivated or reasonably expect to be successful in combining Renoe and Franchini and/or with any of the other cited references since the present invention would still not be produced. There is no guidance in either reference to refer to one another.

Even assuming *arguendo* that it would be possible for a person skilled in the art to replace the manual handling of the samples of the Franchini reference with the automated sampling system disclosed

in Renoe, the present invention is not made when the Renoe reference does not even account for the deficiencies of the other primary reference of Franchini or any other cited reference, wherein both of these references fail to disclose all features as instantly claimed (*i.e.*, see steps 5, 6, 7 and 9 above, wherein both fail to disclose such steps of instantly pending claim 1). Neither Franchini nor Renoe disclose the other characteristic parts necessary in the automated method of claim 1 in the present invention. Thus, there is no motivation or reasonable expectation of success for the skilled artisan to combine these references, and Appellant submits that any rejection based on these references is improper.

With regard to the Examiner's comments in the Advisory Action of March 31, 2004, Appellant submits that an analysis under 35 U.S.C. § 103(a) requires a determination of the scope and content of the prior art, *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966). In determining the scope and content of the cited Franchini and Renoe references as required by *Graham v. John Deere Co.*, an evaluation of the claimed subject matter *as a whole* in the light of the differences between claim 1 of the present invention and Franchini and Renoe reveals that both references are limited in scope in disclosing or teaching the present invention. Specifically, there is no disclosure or recognition of the features 2-7 and 9-11 mentioned above in the primary reference of Franchini or features 2

and 5-10 in Renoe. Thus, the instant rejection under 35 U.S.C. § 103(a) is improper, and Appellant respectfully requests the Examiner to reconsider and withdraw this rejection.

(iii) Cunha

Cunha fails to disclose many features as instantly claimed (see the chart above).

The cited Cunha reference relates to gravimetric burettes and their supplies **with suitable solutions for titration**. In the burette, quantitative analyses of components are performed by titration. However, no titration or no other quantitative analysis is performed in the measuring cell in the present invention. Also in the present invention, the concentration of the component in the measuring cell as well as the temperature are amended in a predetermined way, while at least one dependent physical or chemical property is measured.

Thus, Appellant submits that Cunha does not disclose almost all features of instantly pending claim 1. In fact, Cunha does not account for the deficiencies of any of the other cited references, including the primary reference, making the instant rejections improper (no disclosure of all claimed features to establish a *prima facie* case of obviousness). Further, the cited Cunha reference does not disclose how to make a different solution with a known concentration and how to measure a dependent physical or chemical

property as a function of concentration and temperature (see the chart above summarizing the features of instantly pending claim 1). Due to its titration in the measuring cell, it will also be necessary to completely change the fluid in the measuring cell between each titration. This is another fundamental difference between this reference and the present invention. Thus, Appellant respectfully submits that the disclosure of Cunha does not, whether taken alone or in combination with Franchini (whether proper or not), pertain or disclose the features of the present invention (as defined in claim 1 or claim 4). Reversal of all rejections citing Cunha are accordingly requested.

The Examiner has also cited some references dealing with the problems related to Standard Addition Methods, SAMs, which are a methodology to make **quantitative analyses**. Thus, the references of Saxberg, Li, Bader, Baxter, and Rodriguez all make theoretical studies of different approaches of SAM or investigations of the validity of specific SAMs (said references are further discussed below). Still, Appellant submits that none of the other references describes a process as defined in claim 1 or claim 4. Put differently, there is no disclosure in any of these references of steps 1, 2, 3 and 4 as instantly recited in claim 1 or 4. Since Franchini fails to disclose the mentioned steps as shown in the chart above, Appellant respectfully submits that it is not possible to combine the primary

Franchini reference with any of the other five cited references so as to obtain a method or device as instantly claimed. And as mentioned, neither Renoe nor Cunha account for the deficiencies of Franchini or any other reference. Overall, Appellant respectfully submits that the 5 references or Franchini et al. do not describe the methods as instantly claimed.

(iv) Li

Li fails to disclose all features of claim 1 of the present invention. In fact, Appellant respectfully submits that this reference should not have been cited in the first place based on such a deficient disclosure wherein one of ordinary skill in the art would not even refer to this reference.

The cited Li reference is concerned with standard additions and subtractions methods **for the determination of an unknown concentration** of a known component in a solution. This disclosure itself in Li makes any combination with this reference improper in a skilled artisan's efforts to achieve the present invention. As mentioned, the present invention utilizes concentration as an independent variable.

In Li's method, a standard solution is added to one sample and a blank solution with an equal volume of solution of equal ionic strength to another sample. The volumes of the two solutions are the same (see page 1607, left column, last paragraph of the Li reference).

When the standard solution or blank solution is added, the ionic strength and concentration are changed. It is also disclosed in Li that the activity coefficients of the ions are the same because of the same variation of the ionic strength in the two instances (also at page 1607, left column, last paragraph). Given this disclosure, Li fails to disclose any and all features as instantly claimed (see also the chart above). Despite the Examiner's comments in the Advisory Action of March 31, 2004 at page 2, Appellant respectfully refers the Board to the Abstract of Li which counters the Examiner's position of what Li discloses.

Further, according to Li, the disclosed method gives greater accuracy than the methods used at present. Given this disclosure, one of ordinary skill in the art would readily understand that Li does not describe any of the characteristics of the present invention. Thus, the skilled artisan would not be motivated or reasonably expect to be successful in combining the Li reference with Franchini in order to obtain a method in accordance with the invention or even refer to Li in the first place. Li does not even account for the major deficiencies of Franchini or any of the other cited references (*i.e.*, Renoe). Therefore, Li taken alone or when combined with Franchini does not even disclose or recognize the present invention as instantly claimed. Thus, Appellant respectfully and earnestly requests the Board to reverse any rejection citing Li.

(v) Rodriguez

Rodriguez fails to disclose each and every feature as instantly claimed (see the chart above). Thus, just like the Li reference, Appellant respectfully submits that this reference should not have been cited in the first place based on such a deficient disclosure.

Rodriguez relates to a statistical procedure to validate **analytical** methodology by standard addition methodology (see the Abstract on page 471). Data from three calibration experiments with standard solution, standard additions, and portion of samples are used (see the section titled "Experimental" on page 472 of Rodriguez). This disclosed methodology in Rodriguez is not applicable to the present invention. In the present invention there is no need for the calibrations of analytical measurements, since analytical measurements is not performed. Thus, Appellant respectfully submits that the Rodriguez reference is improperly cited and applied. Further, one of ordinary skill in the art would not even refer to the Rodriguez reference since Rodriguez is directed to analytical measurements (which is not a part of the present invention). To support Appellant's position, the following is submitted.

There are three possible sources of motivation to combine references: the nature of the problem to be solved, the teaching of the prior art, and the knowledge of persons of ordinary skill in the art. *In re Rouffet,* 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58

(Fed. Cir. 1998). Here, Rodriguez is not directed to the same teaching or nature of the problem to be solved as the other cited references nor the present invention. Further, the skilled artisan would not even refer to this reference directed to analytical methodology (see Abstract). Also, despite the Examiner's comments in the Advisory Action of March 31, 2004 at page 2 regarding art and constant volume experiments, Appellant respectfully refers the Board to the enclosed chart showing the deficiencies of Rodriguez. Thus, Appellant respectfully submits that the requisite motivation is lacking with regard to the cited Renoe reference. Appellant requests reversal of all rejections based on the Rodriguez reference.

(vi) Saxberg

Again, Saxberg fails to disclose each and every feature as instantly claimed (see the chart above). Thus, just like Li and Rodriguez, Appellant respectfully submits that the cited Saxberg reference should not have been cited in the first place based on such a deficient disclosure therein.

Saxberg relates to a generalized standard addition method, whereby this reference discloses the mathematics for simultaneous multidimensional analyses. However, Saxberg is not in any aspect related to the aim or principle of the present invention. For a person skilled in the art, it is not obvious as to how and why this

reference is to be combined with Franchini or referred to in the first place. Even if, *arguendo*, Franchini and Saxberg are combined with any of the other cited references, such a combination cannot result in a method as defined in claim 1 or claim 4 of the present invention. This is because Saxberg does not account for the deficiencies of Franchini or any of the other cited references. Thus, Appellant respectfully submits that any rejection citing Saxberg is improper, and request that any rejections based on Saxberg be reversed by the Board.

(vii) Baxter

Similar to Saxberg, Rodriguez or Li, the cited Baxter reference fails to disclose each and every feature as instantly claimed (see the chart above). Thus, Appellant respectfully submits that this reference should not have been cited in the first place based on such a deficient disclosure.

Baxter is directed to a simplified generalized standard method for a direct analysis of solid samples by graphite furnace atomic spectrometric techniques. By varying both a **solid** sample mass and the amount of an analyte, the observed response may be described in a three-dimensional diagram as a function of the solid sample mass and of the analyte. With regard to this disclosure in Baxter, Appellant respectfully submits that one skilled in the art would not combine or

even refer to this reference, upon a reading of Franchini or any of the other cited references, in order to achieve the present invention. Baxter does not even account for all of the deficiencies of any of the references, including Franchini. Further, a combination of the primary reference of Franchini with Baxter would result in a method and a device that is not instantly claimed (solid sample mass; manual method). Accordingly, reversal by the Board of any rejection based on Baxter is respectfully requested.

(viii) Bader

The deficiencies of the cited Bader reference are shown in the above chart (which are significant).

Bader is concerned with **manual** analyses of an **unknown amount** of a known component with SAMs. Bader is completely silent with regard to creating three-dimensional diagram showing a dependent physical or chemical property as a function of the independent variables concentration and temperature. Further, the method disclosed in the cited Case 5 (see page 4 of the Final Office Action) presupposes that the analysis response is proportional to concentration and the responses is plotted in a diagram, from which the unknown concentration is determined. In case 5, the method can be performed either on the same solution, to which additions are made, or on a series of solutions. The method performed on the same solution is said

to save time, since the changing of samples are avoided. Thus, the saving in time is related to other SAMs, where the measurements are performed on a series of solutions. However, only one determination of an unknown concentration is obtained in this way, which shows that SAMs generally are rather time consuming, in comparison with, for example, an analysis method wherein the response of a solution with the unknown content is directly compared with previous prepared response curve. In the latter case, all additions of a solution with a known concentration to the solution with the unknown concentration can be avoided and only one measurement is needed.

Thus, there is no teaching or recognition in Bader that the methods described in any manner can be utilized in the creation of a three-dimensional diagram described in the claimed invention. Thus, Appellant respectfully submits that Bader should not have been cited in the first place.

Further, the cited Bader reference is completely silent with regard to creating three-dimensional diagrams showing a dependent physical or chemical property as a function of the independent variables concentration and temperature. Thus, this reference does not account for the deficiencies of the other references, including the primary reference of Franchini. Accordingly, Appellant respectfully submits that it is not obvious to a person skilled in the art how to perform an automated method for the creation of a

three-dimensional diagram, wherein a physical or chemical property is measured as a dependent variable as a function of temperature and concentration since the disclosure of Bader relates to **quantitative analysis of an unknown concentration.**

Furthermore, one of ordinary skill in the art would not be motivated or reasonably expect to be successful in combining Franchini with Bader, since these references have different objectives and different techniques. Such techniques cannot even be combined (for which the Office Action has not accounted). The Office Action (at page 6, lines 19-20) refers to the "matrix effects" and "greater accuracy" based on the method of Bader. However, Bader (and Franchini) is still deficient in its disclosure. Furthermore, a true combination of Franchini and Bader cannot even theoretically result in an automatic method, which is the objective of the present invention, since both references relate to **manual** methods. These inconsistencies have not been accounted for in the Office Action, nor in the Advisory Action of March 31, 2004. Despite the Examiner's comments in the Advisory Action of March 31, 2004 at page 2, Appellant respectfully refers the Board to the disclosure of Bader as discussed above which counters the Examiner's position of what Bader discloses. Thus, Appellant respectfully and earnestly requests reversal of all rejections based on the cited Bader reference.

(ix) Laughlin

Laughlin fails to disclose all ten steps of instantly pending claim 1. Thus, Laughlin does not account for the deficiencies of any of the other cited references and has been improperly cited and used in the final Office Action.

In contrast to the present invention, Laughlin describes a completely **manual** method to determine the solubility of a surfactant. According to Laughlin, a sample is placed in a tube equipped with a thermometer and the sample is rapidly heated or cooled and continuously stirred to ascertain whether a phase transition exists. If a phase transition is found the sample is heated or cooled past the transition using baths which are not more than 20-30°C above or below the transition. Then the temperature is allowed to drift back towards room temperature and the sample is **visually** observed and the temperature where the separating phase first appears or last disappears is noted. This process is repeated until a reproducible value is obtained. An aliquot of water is then added to the sample in the tube and the procedure indicated above is repeated. At a concentration of about 15%, an aliquot of 1.5-2g of the composition is transferred to a new tube and the dilution is continued to cover the lower concentration. From the data, the phase transitions are connected to smooth curves to show the boundaries in a **two-dimensional diagram** (see Figure 2 in the article). Laughlin does not provide a

numeric value for the cloudiness as a function of temperature and concentration.

The tedious manual method of finding a phase transition and to measure the temperature, at which the phase transmission occurs, disclosed by Laughlin is quite time-consuming. Each readings take about 15 minutes and the determination of the solubility boundaries takes 1 day. No numeric readings of the dependent property are made. Thus, there are not only an essential difference in the method of producing the data but also between the value of the information given in the two-dimension diagram by Laughlin and a three-dimensional diagram of the present invention (see the three dimensional diagram in Figure 2 of the present application, which diagram shows a "landscape" of the dependent property). If anything, the skilled artisan would be taught away from achieving the present invention given the time needed for the Laughlin readings.

Thus, one of ordinary skill in the art would not combine the Laughlin reference with Franchini, or any of the other cited references, when Laughlin or Franchini do not disclose automated methods as instantly claimed. There is no "clear and particular" guidance in the cited references for one of ordinary skill in the art to achieve the present invention, especially considering the disclosed manual, time-consuming methods of the references. *In re Dembiczak*. Also, the access to this type of information is very

valuable and it is evident that Laughlin did not know how to obtain all these data in a simple and rapid manner. Thus, the skilled artisan would understand the patentable distinctions of the present invention over the Laughlin method (whether combined with Franchini or not).

Further, it would not been obvious to one of ordinary skill in the art upon reading the primary reference of Franchini to use the tedious method of Laughlin, since the latter method does not provide any numeric values of the dependent parameter and a rather poor accuracy in the temperature readings, and any saving of time is, during these circumstances, of no interest. In addition, the Franchini disclosure has no real advantage of using the dilution process of Laughlin, since the dilution does not affect the time for the sample **to reach the equilibrium**, which seems to be the main cause for the slow process in Franchini.

Overall, it is evident to one having ordinary skill in the art that both claims 1 and 4 of the present invention are patentable distinct from Franchini and/or Laughlin (whether combined or not). This is in addition to how Franchini does not disclose any of the process steps 2-6 in claim 1 and Laughlin does not disclose any one of the process steps in claim 1. Further, neither of the two references of Laughlin and Franchini discloses an automated method for the characterization of physical and/or chemical properties as function of

temperature and a component concentration as independent variables as instantly claimed.

Accordingly, Appellant respectfully requests the Board to reverse any rejection based on the Laughlin reference.

(x) Summary of Deficient Disclosures and Improper Combinations Thereof

Appellant respectfully submit that the cited combinations of references are improper and that a *prima facie* case of obviousness has not been formed. Appellant has provided a chart to aid the Board in its decision. Appellant earnestly requests reversal of all rejections.

Various reasons for Appellant's position of patentability are explained above. For instance, one of ordinary skill in the art, given the (deficient) disclosure of Franchini (see enclosed chart), would not be motivated or reasonably expect to be successful in combining this reference with any of the other cited references in order to achieve the present invention when Franchini describes, e.g., manual methods and fails to disclose or teach any solution to the problem of handling the large amount of data in connection with the creation of a three-dimensional diagram. As another instance, even though the Examiner is asserting that the Cunha, Li and Renoe references account for the deficient disclosure of Laughlin (*i.e.*, automation aspect of the rejected claims) (see the final Office Action at paragraph 4 on

page 7), the Examiner has still not accounted for the deficient disclosure of Cunha, Li and Renoe themselves. As another example, the cited Laughlin reference does not account for the deficiencies of Franchini, and vice versa (see chart above). Thus, Appellant submits that the outstanding rejections are improper and earnestly request reversal of these rejections by the Board.

Overall, the various Office Actions, including the most recent final Office Action, has not sufficiently explained or established as to why the deficiencies are acceptable for forming a *prima facie* case of obviousness. Further, it is not obvious or possible to combine Laughlin with Renoe, Cunha or anyone of the SAM references in order to obtain an automated method and an automated device in accordance with the present invention for the same reasons mentioned above in considering similar combinations with Franchini.

Based on the above, Appellant respectfully requests reversal of all rejections with regard to pending claims 1 and 4.

3. <u>One of Ordinary Skill in the Art Would Recognize Other Teachings in Cited References and Not Combine Such References</u>

Supplemental to the previous remarks, including how all cited combinations of references are deficient in disclosing the present invention, Appellant provides the following additional remarks.

(i) Recognizing Inconsistencies Between References

At the page 6, the last paragraph of the final Office Action (of December 3, 2003), the Examiner alleges that it would have been obvious at the time the invention was made to replace the successive dilution of Franchini with the successive addition of an analyte containing a solution of known concentration according to the teaching of Bader, Li, Rodriguez or Saxberg because of the reductions of interference due to the matrix effects and the greater accuracy through use of a standard method as taught by Bader, Li, Rodriguez and Saxberg. Appellant respectfully traverses such a conclusion.

It should be observed (and Appellant has previously submitted) that Franchini makes successive dilutions of a solution containing a **known** amount of a **known** compound and perform conductance readings at known concentrations and at known temperatures. A standard addition method (SAM) is a well-known quantitative method of analysis. In such a method, one successive addition of an analyte with a known concentration is added to a sample containing an **unknown** concentration of the analyte. An analytical response is measured before and after each addition. By guidance of the responses it is possible to calculate the **unknown** concentration. The SAM may results in improved accuracy in the termination of the unknown concentration. However, any improved accuracy is not a valid reason to combine Franchini with any of the cited SAM references when Franchini analyses of compounds or

their contents are **not performed**. One having ordinary skill in this art would recognize such an inconsistency. In other words, the problem solved with SAM is not a problem, when creating 3-dimensional diagram showing a physical and chemical properties as a function of concentration and temperature. Thus, Appellant respectfully submits that the cited references have been improperly combined.

(ii) Additional Deficiencies Not Accounted For

Further, at the middle of page 7 of the final Office Action (see paragraph 4), the Examiner asserts that the Laughlin reference does not need to teach the automation aspect, since Cunha, Li, and Renoe show the advantages of using an automated control in the addition of liquids in an **analysis** method. Appellant respectfully disagrees with such a proposition.

As mentioned, each of the cited references is deficient in some respect and cannot account for the deficiencies of each other. Even if, for example, Laughlin was combined with Renoe (samples with different known concentrations), such a combination still would not disclose all instantly claimed features of the present invention. Further, it should be observed that Laughlin is not even directed to three-dimensional diagrams, placing this reference in a nonanalogous art from the present invention.

(iii) Application of Improper Rationale in Combining References

In regard to the Examiner's assertions that the secondary references (*i.e.*, those directed to standard additions methods) are in an analogous art to Franchini because "they are forming a series of samples for analysis" (see the final Office Action at page 7, lines 10-11 from the bottom), Appellant respectfully traverses this conclusion as well. Such a rationale is merely a generalization wherein this rationale means that many different fields of endeavors (arts) can be included. In other words, the Examiner's rationale would mean that any reference directed to "forming a series of samples for analysis" could be included, even though a reference would be directed to an art that is not analogous to Franchini, such as a solution handling system (such as the Renoe reference, which describes a system that produces a large number of individual samples that have to be handled later) or gravimetric burettes and their supplies with suitable solutions for titration (Cunha). Thus, Appellant submits and maintains the position that many of these references have been improperly cited and applied, and are not in an analogous field as the primary Franchini reference. Further, none of the cited secondary references account for the deficient disclosure of the primary references. Accordingly, reconsideration and withdrawal of all rejections are respectfully requested.

(iv) Substantial and Not Some Hindsight Reconstruction Has Been Applied

Further, in the same paragraph at the bottom of the page 7 of the final Office Action, the Examiner declares that the judgment of obviousness is "in a sense necessarily a reconstruction based on hindsight reasoning". Appellant respectfully disagrees with this conclusion. Appellant is aware that **some** hindsight is permissible. However, Appellant is asserting that **substantial and an impermissible level** of hindsight reconstruction has been applied against the present application, and not just some acceptable amount thereof. *See, e.g., In re Fine*, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988); *see also In re Deuel*, 34 USPQ2d 1210, 1215 (Fed. Cir. 1995).

The question here is if the skilled artisan having no knowledge of the actual invention **would have found it obvious** to combine the cited references in such a manner to achieve the present invention. Appellant submits that many inventions are, after their presentation, easy to understand, including any benefits or advantages thereof. Therefore, it is normally easy to search in certain literature for pieces of information and to put them together, even in a manner not suggested. It is also easy to overlook under which circumstances the pieces of information were disclosed. Appellant respectfully submits that this is the situation here. Here, Appellant submits that it is not acceptable to show that certain pieces of information **could** have

been combined by a person skilled in the art given the disclosure of each of the cited references of Franchini, Baxter, Cunha, Renoe, Bader, Laughlin, Li, Rodriguez and Saxberg. This is not the standard under 35 U.S.C. § 103(a). Thus, Appellant respectfully requests that all of these rejections be reversed due to the amount of hindsight reasoning that has been applied.

Also, the final Office Action at page 8 and the upper part of page 9 are full of hindsight reasoning where arguments are phrased and the references subjectively interpreted in order to match on certain characteristics of the claims. For example, in the first three sentences on page 9 of the final Office Action, the Examiner isolates certain pieces of information from the actual disclosure of Bader. As another example, there appears to be no recognition of the fact that the Bader reference relates to a **manual** method of determining the concentration of a **known component** in a sample by making a **plurality of additions** of a solution containing a known concentration to said sample and a **plurality of measurements** after each addition for determining the unknown concentration in the original sample. The disclosure of Bader is not even concerned with the automatic creations of three-dimensional diagram with concentration and temperature as independent variables. As another instance, there appears to be no recognition that the advantage in time refers **only** to other SAMs, and that measurements of an unknown concentration can more easily be made

with just one measurement without any plurality of additions of a solution with a known concentrate and that no measurements of any concentration is performed in the present information. Thus, Appellant respectfully submits that only parts of the cited references have been applied, wherein other essential parts and objectives of these references (*i.e.*, the manual method of Bader) are not properly considered with the present invention.

Thus, Appellant respectfully submits that substantial and an impermissible level of hindsight reconstruction has been applied in the final Office Action regarding the present patent application. Such hindsight reconstruction is improper. *In re Fine.* Still, even if assuming that all of the cited references could be combined (Franchini, etc.), there is still no disclosure of all of the necessary characteristics (see the features as instantly claimed). The present invention would still not be achieved. Thus, reversal all rejections is respectfully requested.

(v) Concluding Remarks

The Examiner has overall failed to establish a *prima facie* case of obviousness. For instance, there is no reference that relates to the objectives of the present invention and even develops an automated method to produce a three-dimensional diagram. The cited primary reference of Franchini discloses that because of the large amount of

data involved, they had to make an empirical approach to the problem. This indicates that it was not obvious to the Franchini et al. team as to how the problem with large amounts of data could be handled. This is an apparent inconsistency with the present invention. Nor has any one of the other cited references (*i.e.*, Renoe; Cunha; etc.) made any suggestions how to solve the objective of the present invention. Appellant further notes that the benefits of the invention are evident, especially in light of how most of the references have been published in the seventies or eighties. It is apparent to one of ordinary skill in the art that no one else has understood how to achieve the present invention, despite the disclosure of all of the cited references. Furthermore, any such combination would still not disclose all features as instantly claimed (please refer to the chart above). Thus, not even the initial requirement of disclosure of all claimed features for a *prima facie* case of obviousness has been satisfied. Reversal of all rejections is respectfully requested.

4. Unexpected Results as a Rebuttal to the Asserted *Prima Facie* Cases of Obviousness

Appellant initially submits that that the cited combinations of the several references are improper, and that a showing of unexpected results is not necessary to overcome the rejection. Still, Appellant respectfully submits that unexpected results do exist for the present

invention, whereby these unexpected results rebuts any asserted *prima facie* case of obviousness based on the cited combinations of Franchini, in view of Baxter and Cunha or Renoe and Bader, Laughlin, Li, Rodriguez or Saxberg.

The large advantage with the present invention is that the dependent variable or variables can rapidly be measured as a function of the two independent variables, temperature and concentration, over a large temperature and concentration ranges in a large number of measuring points without the involvement of people (this is explained by Appellant previously in the reply dated April 18, 2002, at pages 2-3). Hassle and human error in handling a large number of samples is completely avoided.

In addition to the above advantages, all the measuring points and the values of the variables are obtained in electronic format and thus can easily be electronically stored in a computer and coordinated for displaying the results in three-dimensional diagrams. Such diagrams can then be analyzed, which may indicate where two or more phases co-exist in a mixture (as discussed by Appellant in the specification at page 6, starting at line 1). With the present invention, different combinations of data from measurements in turbidity, pH, etc., advantageously offer knowledge about the state of aggregation of dissolved species (*i.e.*, liquid crystalline phases) as a result of changes in the independent variable of concentration or temperature

(see the paragraph bridging pages 5-6 of the specification and Appellant's reply of April 3, 2003 at pages 3-5). Such advantages are not within the disclosure of the cited combinations of references.

Overall, the unexpected advantages of the present invention include the minimum expenditure of time and labor in obtaining data in a form that allows an overview of the dependent variables over a wide range of temperature and concentration values. Further, the present invention has achieved a method and device that simplifies a procedure for three-dimensional diagramming, including phase diagramming (*i.e.*, see the features of independent claims 1 and 7) since the independent variables of temperature and concentration component are predetermined and adjusted by program controls (as explained in Appellant's reply filed April 18, 2002 at page 2, lines 8-23).

The final Office Action appears to believe that the primary reference of Franchini is the closest prior art (Appellant has previously requested clarification if this is not the case in the reply of March 3, 2004 at page 30, and no answer has been provided). Franchini discloses a three-dimensional diagram of the type referred to in the present invention. The cited Renoe reference appears to be close, which relates to an automated method of producing the samples with predetermined concentration of a known component.

Still, a hypothetical combination of Franchini and Renoe would still not result in a method as instantly claimed. First, such an asserted prior art combination will have to handle a large number of samples (in contrast to the present invention having only one sample), which is prepared directly in the measuring cell under the creation of the three-dimensional diagram. Thus, in contrast to Franchini and Renoe, the present invention results in a simpler device and faster measurements. Furthermore, the combined method would only be partially automated and a large amount of data still has to be handled manually. This proposal is in contrast with the present invention.

Appellant respectfully further submits that none of the cited reference describes an automated device having the ability to make all the necessary measurements and to create a three-dimensional diagram, where at least one dependent physical or chemical property is measured and illustrated as a function of the two independent variables, temperature and concentration. The need for such a device is obvious, but no one has been able to find a solution on this problem for decades. This fact alone is strong evidence that the present invention has both novelty and inventive merit.

Thus, Appellant respectfully submits that the present invention has achieved unexpected results that rebut the asserted *prima facie* case of obviousness with regard to the several combinations of

references. Reversal of each and every rejection under 35 U.S.C. § 103(a) is respectfully requested.

Besides the unexpected results of the present invention, Appellant herein requests consideration of all evidence of patentability on record, including the arguments of patentability presented herein.

Arguments for Group II: Claims 2 and 5

Appellant asserts that the cited combinations of Franchini, in view of Baxter and Cunha or Renoe and Bader, Laughlin, Li, Rodriguez or Saxberg do not render claims 2 and 5 as obvious as follows.

Claim 2 recites the following elements of the present invention:

> Claim 2. A method according to Claim 1, characterised in that, A method according to Claim 1, characterised in that, a **series of measurements are done under rising temperature**, and **following series of measurements are done under decreasing temperatures** and **vice versa.**

Claim 5 recites the following elements of the present invention:

> Claim 5. A method according to Claim 1, characterised in that, **the temperature of each measuring point is measured simultaneously wit the physical and/or chemical property.**

The features in claim 2 also at issue are seen from the claim language: "a series of measurements are done under rising temperature," "following series of measurements are done under decreasing temperatures", and "vice versa". The features in claim 5

are seen from the claim language: "the temperature of each measuring point is measured simultaneously wit the physical and/or chemical property".

All of the arguments presented above for Group I apply to Group II as well since claims 2 and 5 each includes the embodiment of claim 1, but with more patentably distinct features. Even assuming, *arguendo*, that all arguments in Group I are unpersuasive, Appellant asserts that each of the cited combinations of references still lacks disclosure of the claimed methods as recited in claims 2 and 5. For instance, there is no disclosure in any of the cited references (nor a suggestion of) the temperature features of claims 2 and 5, such as the claim language of "series of measurements are done under rising temperature" of claim 2. Thus, Appellant respectfully submits that Group II is patentable distinct from the cited combinations of references. Reversal of all rejections of the Group II claims from the Board is respectfully requested.

Arguments for Group III: Claim 6

Appellant asserts that the cited combinations of Franchini, in view of Baxter and Cunha or Renoe and Bader, Laughlin, Li, Rodriguez or Saxberg do not render claim 6 as obvious as follows.

Claim 6 recites the following elements of the present invention:

> Claim 6. A method according to Claim 1, characterised in that, **the predetermined amount of the another liquid added to the liquid amends the concentration of the component in the liquid with 0.01-5 % by weight.**

The features in claim 6 also at issue are seen from the claim language: "the predetermined amount of the another liquid added to the liquid amends the concentration of the component in the liquid with 0.01-5 % by weight".

All of the arguments presented above for Group I apply to Group III as well since claim 6 includes the embodiment of claim 1, but with more patentably distinct features. Even assuming, *arguendo*, that all arguments in Group I are unpersuasive, Appellant asserts that the cited combinations of references still lack disclosure of the claimed methods as recited in claim 6. For instance, there is no disclosure in any of the cited references (nor a suggestion of) the concentration features of claim 6, such as the claim language of "the predetermined amount of the another liquid added to the liquid amends the concentration of the component in the liquid with 0.01-5 % by weight" of claim 6. Thus, Appellant respectfully submits that Group III is patentable distinct from the cited combinations of references. Reversal of all rejections of claim 6 of Group III is respectfully requested.

Arguments for Group IV: Claims 7, 8 and 10

Appellant asserts that the cited combinations of Franchini, in view of Baxter and Cunha or Renoe and Bader, Laughlin, Li, Rodriguez or Saxberg do not render claims 7, 8 and 10 as obvious as follows.

Claim 7 recites the following elements of the present invention:

> Claim 7. A device for the characterisation of the physical and/or chemical properties of a liquid, characterised in that, it comprises
> a) a measuring cell (1) provided with
>
> i) an equipment (2) for the homogenisation of a liquid,
>
> ii) at least two control equipment (3, 17), which comprise or are attached to control programs for changing of the two independent variables, component concentration and temperature, in a predetermined manner, the control equipment (3) of the component concentration comprising a dosage organ for the addition of another liquid containing a different component concentration to the measuring cell,
> iii) at least one measuring organ (9, 13, 14) for the determination of at least one dependent physical and/or chemical property of the liquid, and
>
> iv) optionally a measuring organ (15) for the determination of the temperature,
>
> b) at least one computer (5) for
>
> i) the reception and storage of data relating to the dependent and independent variables via at least one electronic circuit (11', 12', 13', 14', 15') and the calculation of at least the component concentration from data obtained from the control program and
>
> ii) compilation of the received and calculated values into three-dimensional measuring points and
>
> c) equipment (16) for visualisation of the measuring points stored in the computer in a three-dimensional diagram.

Claim 8 recites the following elements of the present invention:

> Claim 8. A device according to Claim 7, characterised in that, the equipment for the control of the temperature of the fluid comprises **a jacket (17) or a heating coil** for the cooling and/or heating by means of a heat transfer medium, whereby **cooling and heating is controlled by a program in the computer (5).**

Claim 10 recites the following elements of the present invention:

> Claim 10. A device according to Claim 7, distinguished by the fact that **control programs are included in the computer (5).**

The features in claim 7 also at issue are seen from the claim language regarding the measuring cell, the various equipment and control equipment, measuring organs, computer, etc. The features in claim 8 are seen from the claim language: "cooling and heating is controlled by the program in the computer (5)". With regard to claim 10, Appellant respectfully refers the Board to the bolded claim language above.

All of the arguments presented above for Group I apply to Group IV as well since claims 7, 8 and 10 are rejected under the same set of combinations of references and have similar features as appealed claim 1 in Group I. Even assuming, *arguendo*, that all arguments in Group IV are unpersuasive, Appellant asserts that still lacks disclosure of the claimed devices as recited in claims 7, 8 and 10. For instance, there is no disclosure in any of the cited references

(nor a suggestion) of the measuring cell having at least two control equipment (3, 17), which comprise or are attached to control programs for changing of the two independent variables of component concentration and temperature as claimed (see claim 7). Thus, Appellant respectfully submits that Group IV is patentable distinct from the cited combinations of references. Reversal of all rejections of the Group IV claims from the Board is respectfully requested.

IX. Conclusion

It is respectfully submitted that Groups I-IV, which includes claims 1, 2, 4-8 and 10, of the clamed invention are allowable, wherein the present invention is patentably distinct from the cited combinations of references. Further, the cited references have been improperly combined. This is because the cited combinations of references of Franchini, Baxter, Cunha, Renoe, Bader, Laughlin, Li, Rodriguez and/or Saxberg at best only generically discloses individual ingredients, without any clear and particular guidance to refer to the disclosure of one another. One having ordinary skill in the art would also not have the proper motivation, based upon the disclosure in the cited references to arrive at such a combination (of the claimed invention). Appellant even submits that one of ordinary skill in the art would not be motivated or reasonably expect to be successful in combining such references due to so many

inconstencies between the references such that one of ordinary skill could not achieve the present invention. Thus, substantial hindsight reconstruction has been applied in order to improperly achieve the present invention. Unexpected results also exist for the present invention, which rebuts any asserted *prima facie* case of obviousness.

For the reasons advanced above, it is respectfully submitted that all claims on appeal in this application are allowable. Thus, favorable consideration and reversal by the Honorable Board of Patent Appeals and Interferences of the Examiner's rejections under 35 U.S.C. § 103(a) of Groups I, II, III and IV encompassing claims 1, 2, 4-8 and 10 are respectfully solicited.

Accordingly, favorable consideration and reversal by the Honorable Board of Patent Appeals and Interferences of the Examiner's various rejections under 35 U.S.C. § 103(a) of claims 1, 2, 4-8 and 10 is respectfully solicited. The Final Rejections of the Examiner is without basis, and should be reversed.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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X. APPENDIX: COPY OF CLAIMS ON APPEAL

Claim 1. A method for the characterisation of physical and/or chemical properties of a liquid, characterised in that,

1) at least one dependent physical and/or chemical property of a liquid is measured in a measuring cell as a function of temperature and a component concentration as independent variables,

2) the values for the component concentration in the measuring cell are determined by calculation, based on data from a control program for the change of component concentration in a computer and the temperatures are determined by calculation from a temperature control program or by measurements;

3) the value of the component concentration in the measuring cell is changed by adding in one step or gradually a predetermined amount of another liquid containing a different component concentration into the measuring cell according to the control program for the change of the component concentration, and a representative number of measurements of the dependent physical or chemical property are performed in the measuring cell within the whole selected temperature range within the predetermined change of the component concentration,

4) the procedures above are repeated at desired component concentrations and temperatures in order to obtain a wanted number of values;

5) the values obtained for the dependent properties are combined with the values for the independent properties to measuring points; and

6) the measuring points electronically stored in the computer are co-ordinated and visualised in a three-dimensional diagram.

Claim 2. A method according to Claim 1, characterised in that, a series of measurements are done under rising temperature, and following series of measurements are done under decreasing temperatures and vice versa.

Claim 4. A method according to Claim 1, characterised in that, the changes in concentration and/or the temperature are controlled by a program in the computer.

Claim 5. A method according to Claim 1, characterised in that, the temperature of each measuring point is measured simultaneously wit the physical and/or chemical property.

Claim 6. A method according to Claim 1, characterised in that, the predetermined amount of the another liquid added to the liquid amends the concentration of the component in the liquid with 0.01-5 % by weight.

Claim 7. A device for the characterisation of the physical and/or chemical properties of a liquid, characterised in that, it comprises

a) a measuring cell (1) provided with

i) an equipment (2) for the homogenisation of a liquid,

ii) at least two control equipment (3, 17), which comprise or are attached to control programs for changing of the two independent variables, component concentration and temperature, in a predetermined manner, the control equipment (3) of the component concentration comprising a dosage organ for the addition of another liquid containing a different component concentration to the measuring cell,

iii) at least one measuring organ (9, 13, 14) for the determination of at least one dependent physical and/or chemical property of the liquid, and

iv) optionally a measuring organ (15) for the determination of the temperature,

b) at least one computer (5) for

i) the reception and storage of data relating to the dependent and independent variables via at least one electronic circuit (11', 12', 13', 14', 15') and the calculation of at least the component concentration from data obtained from the control program and

ii) compilation of the received and calculated values into three-dimensional measuring points and

c) equipment (16) for visualisation of the measuring points stored in the computer in a three-dimensional diagram.

Claim 8. A device according to Claim 7, characterised in that, the equipment for the control of the temperature of the fluid comprises a jacket (17) or a heating coil for the cooling and/or heating by means of a heat transfer medium, whereby cooling and heating is controlled by a program in the computer (5).

Claim 10. A device according to Claim 7, distinguished by the fact that control programs are included in the computer (5).